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Ernst H K Stelzer

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EXAMINER

FINEMAN, LEE A

ART UNIT

PAPER NUMBER

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NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No. 10/538,081	Applicant(s) STELZER ET AL.	
	Examiner LEE FINEMAN	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 25-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 25-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/9/05 & 4/24/07 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10 December 2007 has been entered in which claims 16 and 25-26 were amended and claims 44-45 were added. Claims 1-23 and 25-45 are pending.

Claim Objections

2. Claims 25-41 and 44 are objected to because of the following informalities: Regarding claim 25, the limitation "two-dimensional object illumination region" lacks antecedent basis. The dependent claims inherit the deficiencies of the claims from which they depend. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 16, 18, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Walton et al., US 6,294,327 B1 (henceforth Walton).

Regarding claim 16, Walton discloses in fig. 6 a microscope having at least one illumination beam path (from the diffuse scattering source) and at least one detection beam path (to the CCD array), characterized in that each illumination beam path is provided with a focusing arrangement (cylindrical lens), including a cylindrical lens (fig. 6), for producing a linear object illumination region (column 6, lines 62-63) which extends in the direction of an illumination axis of the illumination beam path (fig. 6), a detection direction (fig. 6) of the at least one detection beam path is approximately orthogonal to the object linear illumination region (fig. 6), and a mobile arrangement (translational stage) is provided for producing a relative movement between the object illumination region and an object to be studied (column 7, lines 16-17), wherein the linear object illumination region is essentially limited to one direction (column 6, lines 62-63).

Regarding claim 18, Walton further discloses that the at least one mobile arrangement (translational stage) is designed to move the object in order to produce a relative movement (column 7, lines 16-17).

Regarding claims 21 and 22, Walton further discloses that the at least one detection beam path has a detector (CCD array) with a multiplicity of detector pixels (column 7, lines 15-16) and that the number and positioning of the detector pixels of the detector are selected so that the at least one detection beam path projects a section of the object, illuminated by the at least one illumination beam path in the object illumination region, essentially fully onto the detector (fig. 6 and column 6, lines 11-20).

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5. Claims 25-27, 29, 32-33, 39-41 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Voie et al., "Orthogonal-plane fluorescence optical sectioning: three-dimensional imaging of macroscopic biological specimens", JOURNAL OF MICROSCOPY, vol. 170, Pt. 3, June 1993, pp. 229-236 (henceforth Voie).

Regarding claims 25 and 29, Voie discloses in fig. 2 a microscope having at least one illumination beam path (along the x-axis) and at least one detection beam path (along the z-axis), characterized in that each illumination beam path is provided with a focusing arrangement (cylindrical lens), including a cylindrical lens (fig. 2), for producing an object illumination region (see fig. 1) which extends in the direction of an illumination axis of the illumination beam path (on the x-axis) and transversely thereto (on the y-axis), a detection direction (on the z-axis) of the at least one detection beam path is approximately orthogonal to the object illumination region (figs. 1 and 2), and a mobile arrangement (specimen holder, see page 232) is provided for producing a relative movement between the two-dimensional object illumination region (see fig. 1) and an object to be studied (see page 232, specimen holder section, especially lines 9-17); and the object is mounted on a holder (specimen holder with rotation shaft), the holder being movable within a sample chamber such that the mobile arrangement can produce a displacement movement of the object within the sample chamber (when there is rotation of the sample by the rotation shaft, the sample is displaced within the sample chamber).

Regarding claims 26 and 27, Voie further discloses that the mobile arrangement can produce a rotational movement of the (specimen holder with rotation shaft; see page 232, specimen holder section, especially lines 9-17); and that the mobile arrangement is designed to

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move the object while the object illumination region is essentially stationary (see page 232, specimen holder section, especially lines 9-17).

Regarding claims 32 and 33, Voie further discloses that a light source (laser) is a lamp or a laser (fig. 2), which provides light of one or more wavelengths (see page 231, Illumination system section and page 232, Illumination optics section) and that scattered light or fluorescent light of one or more wavelengths is used (see page 231, Illumination system section and page 232, Illumination optics section).

Regarding claim 39, Voie further discloses that the at least one detection beam path (along the z-axis) can be adapted so that the detection direction is approximately orthogonal to the object illumination region when the object illumination region is shifted (see page 233, alignment section and fig. 4; the detection beam path remains approximately orthogonal as the object illumination region is moved).

Regarding claims 40 and 41, Voie further discloses the object illumination region is substantially planar-shaped (see fig. 1, when looking perpendicular to the x- and y-axes) and the object illumination region is substantially linearly-shaped (see fig. 1, when looking perpendicular to the y- and z-axes or the x- and z-axes).

Regarding claim 44, Voie further discloses wherein the mobile arrangement provides at least one rotational axis (y-axis direction, see page 232, specimen holder section, especially lines 9-17) being substantially perpendicular to said illumination axis (x-axis) and substantially perpendicular to said detection direction (z-axis).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton in view of Voie.

Walton discloses a translation stage (column 7, lines 16-17), but does not explicitly state that the at least one mobile arrangement is designed to produce a relative movement between the object and the linear object illumination region essentially orthogonally to the illumination axis and the detection direction (i.e., coming out of page) or that the at least one mobile arrangement is designed to move the object to be studied essentially in the direction of the detection direction of the at least one detection beam path. Voie teaches a microscope (fig. 2) which includes a mobile arrangement (stage, see page 232, specimen holder section) which is translatable along an x, y and z axis. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mobile arrangement of Walton translatable along the three axis, which includes the y-axis which is essentially orthogonal to both the illumination axis and the detection direction, as taught by Voie to be able to more effectively image the entire object. Further regarding claim 23, the mobile arrangement using the three axes can also move the object to be studied essentially in the direction of the detection direction of the at least one detection beam path.

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8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton in view of Voie as applied to claim 17 above in view of Horikawa, US 4,893,008.

Regarding claim 19, Walton in view of Voie as applied to claim 17 above disclose the claimed invention except for wherein the mobile arrangement is designed to move the object illumination region while the object is essentially stationary. Horikawa teaches that a system that moves the object and a system that moves the illumination region are art-recognized equivalents in the microscope art (column 1, lines 28-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above equivalent moving/scanning methods in the system of Walton in view of Voie to effectively image the entire object.

Regarding claim 20, Walton in view of Voie as applied to claim 17 above disclose the claimed invention except for wherein the at least one mobile arrangement is designed to move the at least one detection beam path in accordance with the movement of the at least one illumination beam path, at least in its region near the object. Horikawa further teaches in fig. 3 that a system that moves the illumination beam path (via 35) may also move the detection beam path (via 35 to detector 42) It would have been obvious to one of ordinary skill in the art at the time the invention was made to also provide movement of the one detection beam path as taught by Horikawa to provide higher contrast images because no diffused light comes from the area other than the light spot (Horikawa, column 1, lines 14-18).

9. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Horikawa.

Regarding claim 28, Voie discloses the claimed invention except for wherein the mobile arrangement is designed to move the object illumination region while the object is essentially stationary. Horikawa teaches that a system that moves the object and a system that moves the illumination region are art-recognized equivalents in the microscope art (column 1, lines 28-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above equivalent moving/scanning methods in the system of Voie to effectively image the entire object.

10. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Horikawa as applied to claim 29 above and further in view of Lee, US 2002/0163717 A1.

Voie in view of Horikawa as applied to claim 29 above disclose the claimed invention except for explicitly stating that the cylindrical lens can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis and the movement of the cylindrical lens is a high-frequency movement. Lee teaches in fig. 6 a scanning method wherein the cylindrical lens (206) can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis (page 3, sections [0040]-[0042]) and the movement of the cylindrical lens is a high-frequency movement (relative to a slower moving motor system, see section [0042], lines 13-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the moving/scanning of the light beam be done by the

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displacement of the cylindrical lens as taught by Lee to provide a faster, more efficient scanning of the object (Lee, section [0042], lines 15-17).

11. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Stelzer et al., DE 4326473 A1 (henceforth Stelzer).

Voie disclose the claimed invention except for having at least two illumination beam paths with essentially opposite illumination directions are provided for producing at least locally overlapping object illumination regions and the illumination light of the two illumination beam paths interferes at least locally in the direction of the illumination axis in the region of the object illumination region and has a constant, adjustable phase. Stelzer teaches in figs. 1b and 3 a microscope system having at least two illumination beam paths (1) with essentially opposite illumination directions (figs. 1b and 3) are provided for producing at least locally overlapping object illumination regions (fig. 1b) and the illumination light of the two illumination beam paths interferes at least locally in the direction of the illumination axis in the region of the object illumination region and has a constant, adjustable phase (page 3, paragraphs 4-6 of machine translation). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a second illumination beam path as taught by Stelzer to the system of Voie to provide a better dissolution of the image (Stelzer, page 3, paragraphs 4-6 of machine translation).

12. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Palcic et al., US 4,700,298 (henceforth Palcic)

Regarding claim 38, Voie further disclose has a detector (fig. 2 camera). Voie disclose the claimed invention except wherein the detector can be moved laterally with respect to the detection direction of the at least one detection beam path. Palcic teaches that a system that moves the object by a scanning stage and a system that scans by moving the detector laterally are art-recognized equivalents in the microscope art (column 2, lines 22-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above equivalent moving/scanning methods in the system of Voie to effectively image the entire object.

13. Claims 1-3, 5, 8-10, 15, 34, 42-43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Van Eijk et al., US 4,746,800 (henceforth Van Eijk).

Voie further disclose that the object is to be held by a holder (specimen holder) in a sample chamber (see page 232, specimen holder section) in which it can moved along at least one direction (y-axis, see page 232, specimen holder section). Voie disclose the claimed invention except for the holder being configured so that the holder/mobile arrangement can be rotated around an axis corresponding essentially to the gravitational direction. Van Eijk teaches an object holder which can be rotated around an axis corresponding essentially to the gravitational direction (see fig. 5 and at least claim 8, z-axis is in the direction of gravity). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the object holder of Voie also be able to be rotated around an axis corresponding essentially to the gravitational direction as taught by Van Eijk for the purpose of viewing different aspects of the object.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Van Eijk as applied to claim 1 above and further in view of Horikawa.

Voie in view of Van Eijk as applied to claim 1 above disclose the claimed invention except for wherein the mobile arrangement is designed to move the object illumination region while the object is essentially stationary. Horikawa teaches that a system that moves the object and a system that moves the illumination region are art-recognized equivalents in the microscope art (column 1, lines 28-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above equivalent moving/scanning methods in the system of Voie in view of Van Eijk to effectively image the entire object.

15. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Van Eijk and Horikawa as applied to claim 5 above and further in view of Lee.

Voie in view of Van Eijk and Horikawa as applied to claim 5 above disclose the claimed invention except for explicitly stating that the cylindrical lens can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis and the movement of the cylindrical lens is a high-frequency movement. Lee teaches in fig. 6 a scanning method wherein the cylindrical lens (206) can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis (page 3, sections [0040]-[0042]) and the movement of the cylindrical lens is a high-frequency movement (relative to a slower moving

motor system, see section [0042], lines 13-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the moving/scanning of the light beam be done by the displacement of the cylindrical lens as taught by Lee to provide a faster, more efficient scanning of the object (Lee, section [0042], lines 15-17).

16. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Van Eijk as applied to claim 1 above and further in view of Stelzer.

Voie in view of Van Eijk as applied to claim 1 above disclose the claimed invention except for having at least two illumination beam paths with essentially opposite illumination directions are provided for producing at least locally overlapping object illumination regions and the illumination light of the two illumination beam paths interferes at least locally in the direction of the illumination axis in the region of the object illumination region and has a constant, adjustable phase. Stelzer teaches in figs. 1b and 3 a microscope system having at least two illumination beam paths (1) with essentially opposite illumination directions (figs. 1b and 3) are provided for producing at least locally overlapping object illumination regions (fig. 1b) and the illumination light of the two illumination beam paths interferes at least locally in the direction of the illumination axis in the region of the object illumination region and has a constant, adjustable phase (page 3, paragraphs 4-6 of machine translation). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a second illumination beam path as taught by Stelzer to the system of Voie in view of Van Eijk to provide a better dissolution of the image (Stelzer, page 3, paragraphs 4-6 of machine translation).

17. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voie in view of Van Eijk as applied to claim 1 above and further in view of Palcic.

Regarding claim 14, Voie further disclose has a detector (fig. 2 camera). Voie in view of Van Eijk as applied to claim 1 above disclose the claimed invention except wherein the detector can be moved laterally with respect to the detection direction of the at least one detection beam path. Palcic teaches that a system that moves the object by a scanning stage and a system that scans by moving the detector laterally are art-recognized equivalents in the microscope art (column 2, lines 22-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the above equivalent moving/scanning methods in the system of Voie in view of Van Eijk to effectively image the entire object.

Response to Arguments

18. Applicant's arguments with respect to claims 16-23 have been considered but are moot in view of the new ground(s) of rejection.

19. Applicant's arguments filed 10 December have been fully considered but they are not persuasive.

Regarding claim 25, applicant argues that Voie does not disclose that the holder being movable within a sample chamber such that the mobile arrangement can produce a displacement movement of the object within the sample chamber. The examiner respectfully disagrees and points out that the nothing in the specification specifically defines what “a displacement movement” is. Therefore the examiner is taking “a displacement movement” any movement that

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displaces the object. Voie discloses rotation of the sample via a rotation shaft in the chamber (see page 232, specimen holder section, especially lines 9-17). Therefore, Voie does disclose the holder being movable within a sample chamber such that the mobile arrangement can produce a displacement movement (rotation) of the object within the sample chamber.

Regarding claim 1, the applicant argues that Van Eijk is nonanalogous art. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the prior art is in field of applicant's endeavor, i.e., both are optical devices (the microscope of Voie and the lithographic device of Van Eijk) which image an object via optical elements to study, measure or analyze the object.

The applicant further argues that the disclosure of Van Eijk does not specifically disclose that the z-axis is the direction of gravity. The examiner respectfully disagrees. As demonstrated by fig. 5, the apparatus in an upright position is clearly the intended orientation of the system and therefore leads one of ordinary skill to associating the z-axis with the direction of gravity. However, if one is to take the applicant's position that if it is not explicitly stated that the vertical (z-axis) is in the direction of gravity, then it is the case that any axis can be in the direction of gravity and one may consider the rotational axis (i.e., y-axis) of Voie to be along the direction of gravity in some situations.

Finally, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based

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on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schmidt, US 2002/0180989 A1 discloses a system with orthogonal illumination and detection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEE FINEMAN whose telephone number is (571)272-2313. The examiner can normally be reached on Monday - Friday 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lee Fineman/
Patent Examiner, Art Unit 2872
28 February 2008